

Application Serial No.: 10/799,504
Attorney Docket No.: 0160116

REMARKS

This Amendment and Response is in response to the *Advisory* Office Action of August 29, 2005, where the Examiner has rejected claims 1-21. By the present amendment, claims 1 and 15 have been amended, and new claims 22 and 23 have been added. Reconsideration and allowance of outstanding claims 1-23 in view of the following remarks are requested.

A. Rejection of Claims 1-3, 5-6, 8-10, 12-13, 15-17 and 19-20 under 35 USC §103(a)

The Examiner has rejected claims 1-3, 5-6, 8-10, 12-13, 15-17 and 19-20 under 35 USC §103(a) as being unpatentable over Gunduzhan, et al. (US Patent No. 6,889,183) ("Gunduzhan") in view of Klejin (US Patent No. 6,169,970) ("Klejin"). Applicant respectfully disagrees.

Claim 1, as amended, recites a method for recovering a speech frame, the method comprising:

reconstructing a first current input speech frame from a previous input speech frame to generate a reconstructed first current input speech frame in response to an indication that said first current input speech frame has not been properly received;

obtaining a second current input speech frame immediately following said first current input speech frame;

time warping said second current input speech frame and said reconstructed first current input speech frame to coincide a peak of said second current input speech frame with a peak of said reconstructed first current input speech frame while maintaining an intersection point of said second current input speech frame with a third current input speech frame immediately following said second current input speech frame, wherein said time warping generates a time-warped second current input speech frame and a time-warped reconstructed first current input speech frame; and

creating a new second current input speech frame by overlapping-and-adding said time-warped second current input speech frame and said time-warped reconstructed first current input speech frame.

Application Serial No.: 10/799,504
Attorney Docket No.: 0160116

Figure 4 of the present application and its related written description support claim 1, as described below:

As illustrated in Figure 4, time history 420 is the actual received data (see Figure 2) showing the lost frame 202. Time history 410 is a pseudo received data constructed from the received data. Time history 410 is constructed in real-time by placing a copy of received frame 201 into frame slot 202 as frame 201A and into frame slot 203 as frame 201B. Note that frame 203, frame 204, and frame 205 arrive properly in real-time and are correctly received in this illustration. (Page 7, lines 19-24.)

The process involves continuously time warping frames 201B of 410 and frame 203 of 420 so that their peaks, 411 and 421, coincide in time while maintaining the intersection point (e.g. endpoint 422) between frames 203 and 204 fixed. For instance, peak 411 may be stretched forward (as illustrated by arrow 414) in time by some delta while peak 421 is stretched backward (as illustrated by arrow 424) in time. The intersection point 422 must be maintained because the next frame (e.g. 204) may be a correct frame and it is desired to keep continuity between the current frame and the correct next frame, as in this illustration. After time-warping, an overlap-add of the two signals of the warped frames may be used to create the new frame. Line 413 fades out the reconstructed previous frame while line 423 fades in the current frame. (Page 7, line 25, Page 8, line 9.)

Applicant respectfully submits that, at best, Gunduzhan describes the conventional overlap-and-add operation for reconstructing a lost frame. However, as acknowledged by the Examiner, Gunduzhan does not come close to disclosing, teaching or suggesting, prior to the overlap-and-add operation, "time warping said second current input speech frame and said reconstructed first current input speech frame to coincide a peak of said second current input speech frame with a peak of said reconstructed first current input speech frame while maintaining an intersection point of said second current input speech frame with a third current input speech frame immediately following said second current input speech frame, wherein said time warping generates a time-warped second current input speech frame and a time-warped reconstructed first

Application Serial No.: 10/799,504
Attorney Docket No.: 0160116

current input speech frame.”

The Examiner states that the above-recited time warping element of claim 1 is disclosed by Kleijn’s “time shifting operation.” The Examiner further states that Gunduzhan and Kleijn can be combined merely “because they are from a similar field of endeavor in speech signal coding.”

First, the Examiner states that Kleijn discloses “time warping said second current input speech frame and said reconstructed first current input speech frame to coincide a peak of said second current input speech frame with a peak of said reconstructed first current input speech frame while ...,” at col. 9, line 57 – col. 10, line 14 (See Final Office Action.) The cited portion of Kleijn reads:

Like the time-warp function 130, the time-shift function 200 seeks to determine which of the trial original signals generated is closest in form to an identified past speech signal. However, unlike the time-warp function 130, the time-shift function 200 operates by sliding a subframe of the original speech signal, preferably the excitation signal $x(i)$, in time by an amount θ ..., to determine a position of the original signal which yields minimum error when compared with a past speech signal The shifting of the original speech signal by an amount θ to the right (i.e., later in time) is accomplished by repeating the last section of length θ of the previous subframe thereby padding the left edge of the original speech subframe. The shifting of the original speech signal by an amount θ to the left is accomplished by simply removing (i.e., omitting) a length of the original signal equal to θ from the left edge of the subframe. As with time-warping, minimum error is generally associated with time-matching the major pitch pulses in a subframe as between two signals. (Kleijn, col. 9, line 57 – col. 10, line 12.)

As described in Kleijn, time-shift function 200 only slides a subframe of the original speech signal by an amount θ to the right or to left, and determines position of the original signal which yields minimum error when compared with a past speech signal. In contrast, claim 1 recites “time warping said second current input speech frame and said reconstructed first current

Application Serial No.: 10/799,504
Attorney Docket No.: 0160116

input speech frame” In other words, time warping is applied to both said second current input speech frame and said reconstructed first current input speech frame to coincide a peak of said second current input speech frame with a peak of said reconstructed first current input speech frame, as recited in claim 1. In sharp contrast, Kleijn does not shift both a frame or subframe of the original signal and a frame or subframe of the original signal to coincide the peaks. Rather, Kleijn states that only a subframe of the original signal is shifted. Further, Kleijn does not even remotely suggest a desirability of time shifting both a frame or subframe of the original signal and a frame or subframe of the original signal to coincide the peaks. However, because the time warping operation of claim 1 is followed by an add-and-overlap operation, it is significant for the invention of claim 1 that both said second current input speech frame and said reconstructed first current input speech frame are time warped.

Applicant has also added claims 22 and 23 that recite “said time warping warps said second current input speech frame and said reconstructed first current in opposing directions to coincide said peaks,” and “wherein said time warping stretches said second current input speech frame in one direction and said reconstructed first current in another direction to coincide said peaks,” respectively. These claims are further distinguishable over Gunduzhan and Kleijn for the reasons stated above.

Moreover, as stated in response to the Final Office Action, contrary to the Examiner’s statement that Gunduzhan discloses “maintaining an intersection point of said second current input speech frame with a third current input speech frame immediately following said second current input speech frame”, such element is not performed during the overlap-and-add operation of claim 1, but it is performed during the time warping operation of claim 1. In response to this

Application Serial No.: 10/799,504
Attorney Docket No.: 0160116

distinction offered by applicant, in the Advisory Action, the Examiner now states that Klejin also shows the same limitation at column 5, lines 37-65. Applicant respectfully submits that there is no disclosure, teaching or suggestion at column 5, lines 37-65 of Klejin regarding "maintaining an intersection point of said second current input speech frame with a third current input speech frame immediately following said second current input speech frame." Applicant respectfully requests a clarification from the Examiner as to how the cited portion of Klejin discloses such limitation.

Further, Klejin does not remotely teach or suggest that time warping (or even time shifting) is utilized to recover a lost frame. Even more, Gunduzhan has no teaching that remotely suggests that time warping can be utilized prior to the overlap-and-add operation described in Gunduzhan. In short, neither Gunduzhan nor Klejin suggests a desirability of modifying Gunduzhan to include "time warping ... to coincide a peak of said second current input speech frame with a peak of said reconstructed first current input speech frame while maintaining an intersection point ..." prior to the overlap-and-add operation to recover a lost frame. Applicant would like to direct the Examiner's attention to the guidance provided by the Federal Circuit below:

"The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification" (emphasis added) (In re Gordon, 733 F.2d 900, 902 (Fed. Cir. 1984) (see also In re Fitch, 972 F.2d 1260 (Fed. Cir. 1992)).

In a proper obviousness determination, "whether the changes from the prior art are 'minor', ... the changes must be evaluated in terms of the whole invention, including whether the prior art provides any teaching or suggestion to one of ordinary skill in the art to make the changes that would produce the patentee's ... device." (citations omitted.) This includes what could be characterized as simple changes, as in *In re*

Application Serial No.: 10/799,504
Attorney Docket No.: 0160116

Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. (BNA) 1125, 1127 (Fed. Cir. 1984) (Although a prior art device could have been turned upside down, that did not make the modification obvious unless the prior art fairly suggested the desirability of turning the device upside down). (emphasis added) (In re Chu, 66 F.3d 292, 298 (Fed. Cir. 1995)).

Applicant is not claiming "time warping" and acknowledges that "time warping" is a known concept in the art of speech coding. Applicant respectfully submits that Klejin does not disclose more than the fact that "time shifting" or "time warping" is utilized in the art of speech coding. Generally speaking, many inventions include a combination of known or existing elements. However, the mere fact that "time warping" is known in the art of speech coding is insufficient to render claim 1 of the present application obvious in view of Gunduzhan, because there is no suggestion of a desirability by any cited reference, including Gunduzhan, to modify Gunduzhan to include "time warping" prior to the overlap-and-add operation of Gunduzhan for recovery of a lost frame.

Accordingly, applicant respectfully submits that claim 1 and its dependent claims 2-3, 5-6 and 22-23 should be allowed. Further, independent claims 8 and 15 include limitations similar to those of claim 1. Accordingly, claims 8 and 15, and their respective dependent claims 9-10, 12-13, 15-17 and 19-20 should also be allowed.

B. Rejection of Claims 4, 7, 11, 14, 18 and 21 under 35 USC §103(a)

The Examiner has rejected claims 4, 7, 11, 14, 18 and 21 under 35 USC §103(a) as being unpatentable over Gunduzhan in view of Klejin, and further in view of Iijima, et al. (US Patent No. 5,909,663) ("Iijima").

Application Serial No.: 10/799,504
Attorney Docket No.: 0160116

Applicant respectfully submits that claims 4, 7, 11, 14, 18 and 21 depend from claims 1, 8 and 15, respectively. Accordingly, applicant respectfully submits that claims 4, 7, 11, 14, 18 and 21 should be allowed at least for the same reasons stated above in conjunction with patentability of claims 1, 8 and 15.

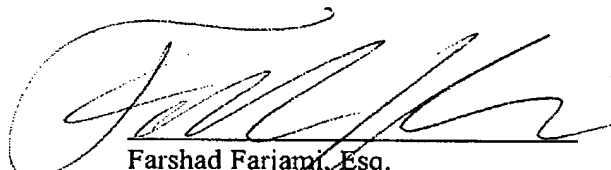
C. Conclusion

Based on the foregoing reasons, an early Notice of Allowance directed to all claims 1-23 pending in the present application is respectfully requested.

Respectfully Submitted,
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